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EXAMINER

TRIMMINGS, JOHN P

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,170

Applicant(s)

ZERBE ET AL.

Examiner

John P Trimmings

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-53, 56-65 and 68-93 is/are rejected.
- 7) ☒ Claim(s) 54, 55, 66 and 67 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/12/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/20/04, 10/28/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the applicant's amendment dated 5/17/2004.

Claims 89-93 were added by the applicant.

Claims 23 and 49 were amended.

Claims 1-93 are pending in this Office Action.

Information Disclosure Statement

The examiner acknowledges receipt of the Information Disclosure Statements of 5/20/2004 and 10/28/2004, and has considered said statements.

Response to Amendment

1. In view of certain amendments directed toward the Drawings (page 5 of amendment), the examiner withdraws all objections to the Drawings.
2. In view of the changes to the Specification, the examiner withdraws all objections to said Specification.
3. In view of the changes to the Specification, the examiner withdraws the rejection of Claims 82 and 88 under 35 USC 112 first paragraph.
4. In view of the amendment to Claim 23, the examiner withdraws the rejection of Claim 23 under 35 USC 112 second paragraph.

Response to Arguments

The applicant, in arguing the examiner's rejections, has chosen, in all but two cases (Claims 79 and 85), to rebut the independent claims only, and has elected to allow the dependent claims to stand or fall with their linked independent claims.

As per Claim Rejections - 35 USC § 102:

5. Applicant's arguments re: Claim 79 (see page 10 of amendment), filed 5/17/2004, with respect to uniting structures within the transmit circuit into a repeating pattern generator in test mode, have been fully considered and are persuasive. The rejection of Claim 79 has been withdrawn.

6. Applicant's arguments re: Claims 77 and 83 and 85, filed 5/17/2004, have been fully considered but they are not persuasive. The applicant has argued that independent Claims 77, 83 and dependent Claim 85 of Johnson fail to anticipate the invention. The examiner disagrees.

As per Claim 77:

Argued is the failure to pass "data to be transmitted through the transmit circuit when the transmit circuit when the transmit circuit is operating in normal mode" (page 8 and 9 of amendment). The examiner maintains that the DQ data of FIG.2 is indeed transmitted data (from the SLDRAM transmit Memory Controller 11 of FIG.1), and that this data is the normal data path as indicated by FIG.2 51 to 59 to 63 to 67.

Argued is the failure to generate "a transmit repeating pattern in the transmit circuit when the transmit circuit is operating in test mode" (page 9 of the

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amendment). The examiner maintains that the memory controller of FIG.1 13 (being the transmit circuit) does generate a repeating pattern (column 3 lines 2-13) in the transmit circuit during test mode (column 1 lines 40-67).

Argued is the failure to anticipate "evaluation of a digital signal system" (page 10 of amendment). But the teachings of column 12 lines 5-21 does teach this feature; by (1) setting a delay value, (2) receiving the signal, (3) comparing, and evaluating for coincidence, a received signal with an expected signal.

For the above reasons, the examiner maintains the rejection of Claim 77.

As per Claim 83:

Argued is the failure to anticipate "passing receive data through the receive circuit when the receive circuit is operating in normal mode". The "receive circuit" in this reference is the SLDRAM of FIG.2, which said receive circuit consists of both transmit leg (61, 49, 47) and receive leg (51, 59, 63). The "passing of receive data" belonging to the SLDRAM therefore is correctly characterized as going in either direction through the reference SLDRAM.

Argued next is the failure of Memory Controller 13 to anticipate a "receive repeating patter" (page 12 of amendment). This is interpreted thus by the applicant, but is not stated by the examiner. In actuality, the Next State Generator 107 of FIG.8 is a repeating pattern generator, and is also located in the receive portion (FIG.2 Control Logic 21). And when operating in test mode under control of FIG.2 Control Logic 21, the examiner maintains that FIG.8 DQ is connected to FIG.8 107 for comparison by way of the Latch 59 of FIG.2.

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Lastly, argued is the failure to anticipate “evaluation of a digital signal system” (page 13 of amendment). But the teachings of column 12 lines 5-21 does teach this feature; by (1) setting a delay value, (2) receiving the signal, (3) comparing, and evaluating for coincidence, a received signal with an expected signal.

For the above reasons, the examiner maintains the rejection of Claim 83.

As per Claim 85:

Argued is the failure to anticipate “uniting a plurality of pipeline structures within the receive circuit into a receive repeating pattern generator when the receive circuit is operating in the test mode (page 14 of amendment). But the examiner maintains that the pipeline structure 101 of FIG.8 is united with the repeating pattern generator 107 of FIG.8 and FIG.6 when in test mode (under control of FIG.2 21). The process of uniting (examining step d) occurs in column 12 line 5-21.

For the above reasons, the examiner maintains the rejection of Claim 85.

As per Claim Rejections - 35 USC § 103:

As per Claim 1:

The applicant argues that Gauthier fails to teach a receive circuit that generates a first pattern (page 17 of amendment). But the examiner disagrees with the applicant's interpretation of the teachings of FIG.1 of the reference. In particular, the Circuit Under Test 20 was mistakenly referred to as the “receive circuit”. But the examiner interprets the drawing as follows:

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(1) a transmit circuit (5, 15).

(2) the transmission medium (20), which may be a wire between x and y.

(3) a receive circuit (50, 60).

Interpreting FIG.1 as outlined above would lead to the teachings set forth by the examiner in the rejection of this claim, and so Gauthier's part in the rejection is maintained.

And the argument rejecting the motivation for combining the clock adjustment process based on error detection of Chao is also maintained by the examiner. The receiver compares for valid data received, and adjusts a clock (parameter) to maximize reception (see Abstract) for the advantage of better control of data reception (column 1 of Chao). The examiner contends that the motivation for Chao is obvious, and applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., pass/fail method and clock adjustment method), are not recited in the rejected claim. Although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

For the above reasons, the examiner maintains the rejection of Claim 1.

As per Claim 49:

The applicant argues that Gerowitz does not teach "a transmit data storage element adapted to receive data from a transmit data input and sequentially transmit" (page 31 of amendment). But the examiner disagrees. Since the Gauthier reference failed to further teach "sequentially" transmitting

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data, Gerowitz was "adapted" to Gauthier by the examiner with the motivation stated, wherein Gauthier's parallel data was received by Gerowitz storage elements, and was serialized for transmission to the receiver (see Abstract). In other words, the deficiency of Gauthier was corrected by Gerowitz by adding the serializer, and in doing so, the claim was rendered obvious.

And when the applicant argues that Gerowitz does not teach testing the link (page 31, 32 of amendment), the examiner contends in rebuttal that there is no allegation of a need to test the link in Gerowitz. Testing is taught in Gauthier, therefore Gerowitz requires only to perform the function of serializing parallel data.

And, where the applicant argues the placement of multiplexers (page 33 of amendment), the examiner contends that by describing the joining of the two references at the multiplexers, the parallel to serial conversion of the transmitted test data of Gauthier data would be attained.

For the above reasons, the examiner maintains the rejection of Claim 49.
As per Claim 61:

In rejecting the receiver claimed by the applicant, the examiner provided a second reference of Koga in combination with Gauthier to teach the claim in much the same manner as was done for Claim 49 above. In other words, upon receiving a transmitted serialized data, Koga performs the function of performing a serial to parallel conversion (although not required or claimed by the applicant in this claim) for the purpose only of converting data that would have been transmitted in series. The remaining functions performed by Gauthier are the

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same "receiver" functions, which were misinterpreted by the applicant in Claim 1 above, where receiver (Gauthier FIG.1 50, 60) discloses all features of the claim.

And, in rebuttal to the applicant's argument of motivation (page 38 of amendment), for the same reasons as in Claim 49 above, one only needs to satisfy the missing feature of one reference in the other reference with motivation, without a requirement of matching all features of both together.

In response to the arguments in the amendment, Claims 1-53, 56-65, 68-78 and 80-88 are maintained as rejected.

Claim Objections - (New Claims)

7. Claims 90-93 objected to because of the following informalities: The claims used the word "adapted to", which is not a positive limitation. The examiner requests that the word "adapted" be changed to a positive limitation. Appropriate correction is required.

Claim Rejections - 35 USC § 112(New Claims)

8. Claims 90 and 92 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The examiner has failed to locate any reference to receiving parallel data in a transmitter in a normal mode (Claim

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90), and outputting parallel data in a receiver in a normal mode (Claim 92). The applicant has not taught enablement of such features.

Claim Rejections - 35 USC § 103(New Claims)

9. Claim 89 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gauthier et al., U.S. Patent No. 5228042, in view of Chao et al., U.S. Patent No. 6671847. Gauthier et al teaches a method of testing a circuit by first generating a repeating transmission pattern (FIG.1 5), transmitting the pattern to a receiver (FIG.1 20), where "Circuit Under Test" is the medium, generating a receive pattern (FIG.1 50), and comparing the two patterns (FIG.1 60 and column 5 lines 23-43). Gauthier however does not teach the adjustment of a parameter that affects reception of the repeating pattern based on the comparison. In an analogous art, Chao et al. does teach this limitation (see Abstract and column 6 lines 11-55). In testing of I/O devices, Chao et al. asserts that timing adjustments between transmitter and receiver need to be more closely controlled (column 1 lines 11-63) by the referenced invention. And one with ordinary skill in the art at the time of the invention, motivated by Chao et al., would find it obvious to combine the two inventions in order to maximize reception, and so the claim is rejected.

10. Claim 90 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gerowitz et al., U.S. Patent No. 6222380, in view of Gauthier et al., U.S. Patent No. 5228042. Gerowitz et al. teaches a transmit data storage element (FIG.2 L1, L2, L3, L4) adapted to receive parallel data from a transmit data input (FIG.2 D0,

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D1, D2, D3) to be sequentially transmitted as transmit data out when operating in normal mode (FIG.2 Q). But, Gerowitz et al. does not teach a repeating pattern in a test mode. However, in an analogous art, Gauthier et al. does teach providing a repeating pattern (FIG.1 5) in a test mode (FIG.1 Control Circuit 30) and transmitting the data out via medium 20. By joining the multiplexers of the two references, (Gauthier et al. FIG.1 15 and Gerowitz et al. FIG.2 21), one would have a data storage element consisting of both latches (in Gerowitz et al.), and a shift register (in Gauthier et al.), and one would be able to provide a sequentially transmitted repeating pattern in test mode, or normal data when not in test mode. Gauthier et al., in column 1 lines 43-52 states as an advantage an improved method and circuit for test, utilizing less test hardware memory. One with ordinary skill in the art at the time of the invention, motivated as indicated by Gauthier et al., would combine the two references in order to convert parallel input data to serial transmitted data as well as providing for repeating test data, and so the claim is rejected.

11. Claim 91 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pyhalammi, U.S. Patent No. 5237561, in view of Gauthier et al., U.S. Patent No. 5228042. Pyhalammi teaches a transmit data storage element (Modem 53 in FIG.3) adapted to receive serial data (from serializer 524 in FIG.3) and sequentially transmitting serial data (FIG.3 56) when in normal mode. Not taught by Pyhalammi is a test mode, in which the modem transmits a repeating pattern. But in the analogous art of Gauthier et al., this feature is taught in FIG.1 5. And, Gauthier et al., in column 1 lines 43-52 states as an advantage an improved

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method and circuit for test, utilizing less test hardware memory. One with ordinary skill in the art at the time of the invention, motivated as indicated by Gauthier et al., would combine the two references in order to test serial hardware using less hardware memory, and so the claim is rejected.

12. Claim 92 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koga, U.S. Patent No. 6339387, in view of Gauthier et al., U.S. Patent No. 5228042. Koga teaches a receive data storage element (FIG.1 C8, C9, C10, C7) adapted to output parallel data from a receive serial data input (FIG.1 DATA) when operating in normal mode. However, Koga does not teach a test mode. But the analogous art of Johnson et al. does teach that during a test mode (FIG.2 21 controller); providing a repeating pattern signal when the receive circuit is operating in test mode (FIG.8 107), and a comparison element (FIG.8 109) adapted to perform a comparison of a relationship between the repeating pattern signal and the serial receive data input signal (FIG.8 101) and to produce a comparison output signal based on the comparison (FIG.8 113). And Johnson et al., in column 2 lines 60 to 65, cites the advantage as a unique way to obtain faster and reliable calibration of data paths. One with ordinary skill in the art at the time of the invention, motivated as suggested, would have found it obvious to apply the Johnson et al. test system to the parallel/serial converter of Koga for more reliable calibration, and so the claim is rejected.

13. Claim 93 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pyhalammi, U.S. Patent No. 5237561, in view of Gauthier et al., U.S. Patent No. 5228042. Pyhalammi teaches a receive data storage element (Modem 55 in

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FIG.3) adapted to receive serial data (from Modem 53 in FIG.3) and sequentially forwarding serial data (to FIG.3 54) when in normal mode. Not taught by Pyhalammi is a test mode, in which the modem provides a repeating pattern. But the analogous art of Johnson et al. does teach that during a test mode (FIG.2 21 controller); providing a repeating pattern signal when the receive circuit is operating in test mode (FIG.8 107), and a comparison element (FIG.8 109) adapted to perform a comparison of a relationship between the repeating pattern signal and the serial receive data input signal (FIG.8 101) and to produce a comparison output signal based on the comparison (FIG.8 113). And Johnson et al., in column 2 lines 60 to 65, cites the advantage as a unique way to obtain faster and reliable calibration of data paths. One with ordinary skill in the art at the time of the invention, motivated as suggested, would have found it obvious to apply the Johnson et al. test system to the parallel/serial converter of Koga for more reliable calibration, and so the claim is rejected.

Allowable Subject Matter

14. Claims 54, 55, 66, 67 and 79 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The examiner adds that Claims 54, 55, 66 and 67 were previously objected to as being allowable in the examiner's 1st Office Action, and Claim 79 is objected to in this Office Action in view of the examiner's withdrawal of the claim rejection under 35 USC 103 above.

In this Office Action:

Claims 54, 55, 66, 67 and 79 were objected to.

Claims 1-53, 56-65 and 68-88 are maintained as rejected.

Claims 90 and 92 are new, rejected under 35 USC 112.

Claims 89-93 are new, rejected under 35 USC 103.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P Trimmings whose telephone number is (571) 272-3830. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John P Trimmings
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